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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,771	10/29/2003	Supratik Guha	YOR920030416US1	7919

48355 7590 04/25/2007
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EXAMINER

TRAN, BINH X

ART UNIT	PAPER NUMBER
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1765

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/25/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/696,771

Applicant(s)

GUHA ET AL.

Examiner

Binh X. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02-16-2007 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3-9, 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Liu et al. (US 6,642,129).

Respect to claim 1, Liu discloses a method for chemical fabricating or altering a sub-micro-structure on an object, comprising:

providing a heating means proximate to a local region of the object wherein said heating means includes a heat emitting surface (col. 2 lines 53-63, col. 5 line 59 to col. 6 line 8);

providing at least one reactant (patterning compound 26, or pattern 28 or water meniscus 30) on the local region of the object (24) (Fig 1-2, col. 4 lines 40-60, col. 5);

selectively heating the local region using the heating means to facilitate in the local region a local chemical reaction for forming or altering a sub-microstructure on the local region (Fig 1-2, col. 4-5).

Respect to claims 3, Jacobson discloses the local region is provided with a liquid phase, wherein in the liquid phase comprises at least one of a thin film layer (28) and a droplet form (i.e. water meniscus 30) (See col. 4 lines 45-60). Respect to claim 4, Liu discloses the chemical reactions effects at least one of depositing process (col. 4 lines 65 to col. 5 line 9, col. 5 line 40-44, line 50-58). Respect to claim 5, Liu discloses the heating means is adapted to the first end of a cantilever, and the cantilever has a second end couple to a device for positioning the heating means (Fig 2-4, Fig 8). Respect to claim 6, Liu discloses the heating means is a thermal actuator (col. 9 lines 54-55, read on "thermal transducer") (read on nanoheater or thermal transducer, See paragraph 0077). Respect to claim 7, Liu discloses the sharp tip has a radius of curvature less than 100 nm (i.e. diameter less 200 nm, col. 8 lines 31-35, read on applicant's range of about 10 to 200 nm). Respect to claims 8-9, Liu teaches the heat-conductive medium is a reactant (Fig 1-2). Respect to claim 12, Liu discloses the

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submicrostructure is a portion of an integrated circuit (col. 1 line 60 to col. 2 line 12, col. 5 line 1-5).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Demers (US 2004/0101469 A1).

Respect to claim 10, Liu fails to disclose the submicrostructure is a defect-eliminating feature formed or altered on a portion of a lithographic reticle or mask. However, Liu clearly teaches to form a pattern on a substrate using dip pen nanolithography (DPN) process. Demers teaches to form submicrofeature having resist pattern on a substrate using a DPN process (Fig 3, 5, paragraph 0076, 0138, read on

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"defect eliminating feature formed on a portion of a lithographic reticle or mask"). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Liu in view of Demers by having the submicrofeature is a defect-eliminating feature form on a portion of a lithographic reticle or mask because equivalent and substitution of one for the other would produce an expected result.

Respect to claim 11, both Liu and Demers teaches the chemical reactions performed at least one of a depositing a film in an opaque substrate (read on "opaque region").

7. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Yu (US 6,291,302).

Respect to claims 13-14, Liu discloses the submicrostructure is a portion of an integrated circuit (col. 5 lines 1-5). However, Liu fails to disclose the portion is at least one of a line, a conductive via, a contact pad, and a dielectric pad. Yu discloses the submicrostructure is a portion of an integrated circuit (IC) including a gate stack (16) read on "a line" limitation in claim 13), or a field effect transistor (abstract). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Liu in view of Yu by forming a line or a field effect transistor because these features are well known in integrated circuit.

Respect to claim 15, Yu discloses the chemical reaction is at least one of the reactions forming source and drains regions or gate stack (col. 4 lines 20-26, col. 5 lines 5-23).

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8. Claim 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Mirkin et al. (US 2004/0142106 A1).

Respect to claim 14, Liu fails to disclose the submicrostructure is a portion of a field effect transistor. However, Liu clearly teaches to form a pattern on a substrate using dip pen nano-lithography (DPN) process. Mirkin teaches to use DPN process to deposit submicrostructure including field effect transistor (paragraph 0050). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Liu in view of Mirkin by having the submicrofeature is a portion of a field effect transistor because equivalent and substitution of one for the other would produce an expected result.

9. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu in view of Choi et al. (US 6,762,402).

Respect to claim 16, Choi teaches the submicrostructure is an information containing portion of a record medium (abstract, col. 8 lines 1-35). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Liu in view of Choi by using a tip to record and read data on a recording medium because this the reliability of a sub-miniature storage device can be significantly enhanced (col. 8 lines 13-15).

10. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Liu and Choi as applied to claim 16 above, and further in view of Field (US 2003/0222965 A1).

Respect to claim 17, Liu and Choi fails to disclose the recording medium comprises at least one of digital video disks and compact recording disks. However,

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Choi clearly disclose a recording medium. Field discloses a recording medium includes DVD or CD (paragraph 002, 015). It would have been obvious to one having ordinary skill in the art, at the time of invention, to modify Liu and Choi in view of Field by using DVD or CD because equivalent and substitution of one for the other would produce an expected result.

Response to Arguments

11. Applicant's arguments with respect to claims 1, 3-17 have been considered but are moot in view of the new ground(s) of rejection. Specifically, applicants argue that the previous cited prior art (i.e. Jacobson, Yu or Albrecht) fail to disclose "a heat surface embedded in said heating means". This arguments has been considered but are moot in view of the new ground(s) of rejection as discussed above

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Binh X. Tran whose telephone number is (571) 272-1469. The examiner can normally be reached on Monday-Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Binh Tran

Binh X. Tran